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ABSTRACT

Children residing in McLean County, Kentucky, and attending grades three through six who either had or had not attended kindergarten were compared in terms of academic aptitude, total reading, language expression, and math application scores on the Comprehensive Test of Basic Skills (CTBS). It was found that students who had attended kindergarten scored higher in academic aptitude at all four grade levels tested than students who had not attended kindergarten. These differences were significant at grades three, four, and six. When academic aptitude was built into analyses of achievement measures as a covariate to statistically equate groups on ability, children who had attended kindergarten were found to outscore children who had not attended kindergarten in all three achievement measures at every grade level tested. However, differences between groups were large enough to produce statistical significance in only one of the 12 comparisons--language expression at the third grade level. It was concluded that McLean students who attended kindergarten tend to outperform students not attending kindergarten when differences in academic ability are controlled. (Comparisons also were made between each of the two groups and national norms.) (Author/RH)

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Does Kindergarten Make A Difference?

PREPS RESEARCH PROJECT

1980-81

The McLean County School System
Calhoun, Kentucky

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FORWARD

This is the final report of a research project conducted by Mr. John Settle of the McLean School System and the Research Team of the Professional Development Center Network.

INTRODUCTION

The administration of the McLean County School System of Kentucky felt that attendance in kindergarten might make a difference in students' achievement over the elementary school years. Teachers in the McLean system had reported a difference in student learning in the classroom during the early elementary years. This study was designed to explore whether this teacher perceived difference lasted beyond the early school years. Specifically, it contrasted kindergarten and non-kindergarten attendees in three areas of achievement (total reading, language expression, and math achievement) during third through sixth grade.

POPULATION

All third through sixth grade McLean students who took the regularly scheduled achievement tests in the Spring of 1980 formed the population of the study.

INSTRUMENTATION

Data was students' scoring in four areas: (1) academic aptitude, (2) total reading, (3) language expression, and (4) math application. These data were collected at the 1980 annual Spring administration of the Comprehensive Test of Basic Skills (CTBS). The CTBS is distributed by McGraw-Hill. Tests were scored by the Kentucky State Department of Education.

DATA COLLECTION

Data for the study was taken from students' school records.

FINDINGS

The study will be reported in four parts. The first part is concerned with probing the academic aptitude of students in both groups. The second, third, and fourth parts will report group differences in the three achievement areas.

Academic Aptitude

Prior to comparing achievement scores for students who attended and did not attend kindergarten, analyses were calculated to compare the two groups' academic achievement scores. It was reasoned that parents had chosen to send or not send children to kindergarten and that this decision might have been tied to social factors which in turn might have influenced later learning as much as attendance in kindergarten. As no other record was easily available to compare differences in students' home background, academic aptitude was used to determine whether students in the two groups were equal in academic ability. Should similar scores in academic aptitude have been found, it would help support the contention that students in the two groups were equal in academic ability and that any differences in their achievement measures were associated with attendance or non attendance in kindergarten. Further, a finding of no significant difference in academic aptitude would indicate that a direct comparison of achievement data was indicated.

Table 1 shows the results of F-tests comparing the two groups on academic ability. In all cases kindergarten attendees scored higher than non kindergarten attendees. At three grade levels (third, fourth, and sixth) these differences between groups were large enough to be significant. Therefore, it was assumed that groups were not equal in academic ability and that direct comparison of achievement data would

be inappropriate. Consequently, academic aptitude was built into analyses on achievement measures as a covariate to statistically equate groups on ability.

Table 1

Means, (Standard Deviations), and n's
Along with Test of Significance on
Academic Aptitude for Students
Attending and Not Attending Kindergarten
By Grade Level

Grade	Attendance in Kindergarten		F-Test	Probability of F-Test
	Yes	No		
Three	110.83 (60.98) n=107	93.55 (26.85) n=49	7.92*	0.006
Four	106.97 (10.65) n=94	100.16 (14.01) n=44	9.96*	0.002
Five	106.11 (10.74) n=70	103.06 (11.57) n=51	2.24	0.14
Six	107.66 (12.25) n=70	101.55 (16.11) n=80	6.68*	0.01

* F-tests significant at or beyond the 0.05 level

Total Reading

Data in Table 2 shows no significant differences at any grade level between kindergarten attendees and non-kindergarten attendees in total reading when scores were statistically adjusted for academic aptitude. However, it should be noted that in all comparisons kindergarten attendees scored higher than non-kindergarten attendees. When mean scores of the two groups were compared to national norms, it was found that kindergarten attendees were reading half a grade to a full grade above non-kindergarten attendees who were reading anywhere from half a grade to a full grade above the national norming group. Figure 1 compares McLean students' scores with national norms.

Table 2

Means, (Standard Deviations), and n's
Along with Tests of Significance on
Total Reading for Students Attending and
Not Attending Kindergarten
By Grade Level
(Academic Aptitude Used as a Covariate
to Statistically Equate Groups)

Grade	Attendance in Kindergarten		F-Test	Probability of F-Test
	Yes	No		
Three	416.49 (55.43) n=107	383.71 (82.64) n=49	1.61	0.21
Four	465.62 (68.13) n=94	431.66 (69.71) n=44	0.20	0.66
Five	484.34 (59.39) n=70	470.63 (90.99) n=51	0.04	0.84
Six	532.14 (69.44) n=70	509.49 (61.32) n=80	0.23	0.63

* F-test significant at or beyond the 0.05 level

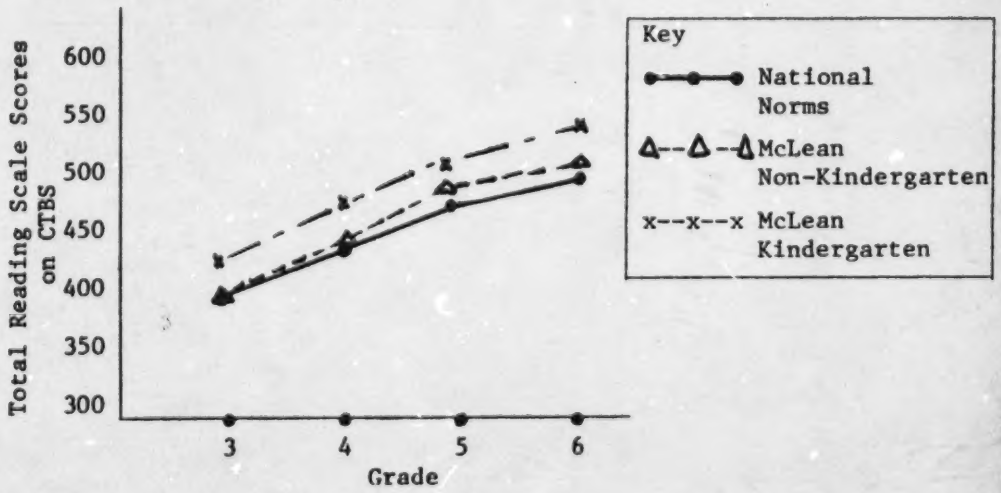

Figure 1

Comparison of McLean Students Attending Kindergarten
and Not Attending Kindergarten with National Norms
in Total Reading

Language Expression

Data in Table 3 shows a significant difference between kindergarten and non-kindergarten attendees in language expression at grade three and no significant difference between groups at grades four, five, and six. (All tests statistically equate scoring for differences in academic aptitude). Moreover, it should be noted that in all comparisons kindergarten attendees scored higher than non-kindergarten attendees. When mean scores of the two groups were compared to national norms it was found that kindergarten attendees showed language expression skills anywhere from one to almost two grade levels above non-kindergarten attendees who scored anywhere from one grade to two grades above the national norming group. Figure 2 compares McLean students' scores with national norms.

Table 3

Means, (Standard Deviations), and n's Along with Tests of Significance on Language Expression For Students Attending and Not Attending Kindergarten By Grade Level (Academic Aptitude Used as a Covariate to Statistically Equate Groups)

Grade	Attendance in Kindergarten		F-Test	Probability of F-Test
	Yes	No		
Three	477.87 (54.01) n=107	443.78 (84.72) n=49	4.31 *	0.04
Four	506.50 (49.60) n=94	476.53 (59.93) n=44	1.95	0.17
Five	522.44 (61.85) n=70	508.26 (91.78) n=51	0.005	0.95
Six	553.49 (66.89) n=70	542.90 (65.20) n=80	0.35	0.55

* F-Test significant at or beyond the 0.05 level

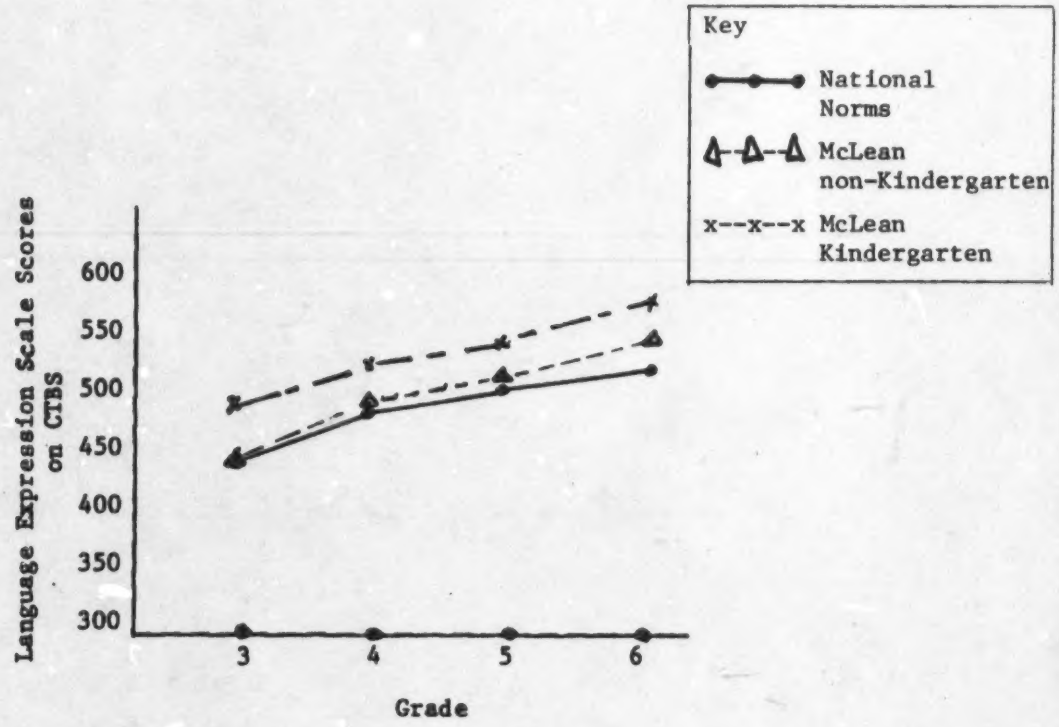

Figure 2

Comparison of McLean Students Attending Kindergarten and Not Attending Kindergarten with National Norms in Language Expression

Math Application

Data in Table 4 shows no significant difference at any grade level between kindergarten attendees and non-kindergarten attendees in math application when scores were statistically adjusted for academic aptitude. However, it should be noted that in all comparisons kindergarten attendees scored higher than non-kindergarten attendees. When the mean scores of the two groups were compared to national norms it was found that kindergarten attendees showed math application skills from one half to one and one half grades above McLean non-kindergarten attendees who scored anywhere from half a grade below to slightly above the national norming group. Figure 3 compares McLean students' scores with national norms.

Table 4

Means, (Standard Deviations), and n's Along with Tests of Significance on Math Application For Students Attending and Not Attending Kindergarten By Grade Level (Academic Aptitude Used as a Covariate to Statistically Equate Groups)

Grade	Attendance in Kindergarten		F-Test	Probability of F-Test
	Yes	No		
Three	400.25 (54.20) n=107	371.37 (73.49) n=49	3.20	0.08
Four	437.49 (66.20) n=94	398.41 (71.28) n=44	1.38	0.24
Five	469.33 (59.79) n=70	438.84 (96.94) n=51	2.34	0.13
Six	503.76 (64.12) n=70	484.93 (67.39) n=80	0.12	0.73

* F-Test significant at or beyond the 0.05 level

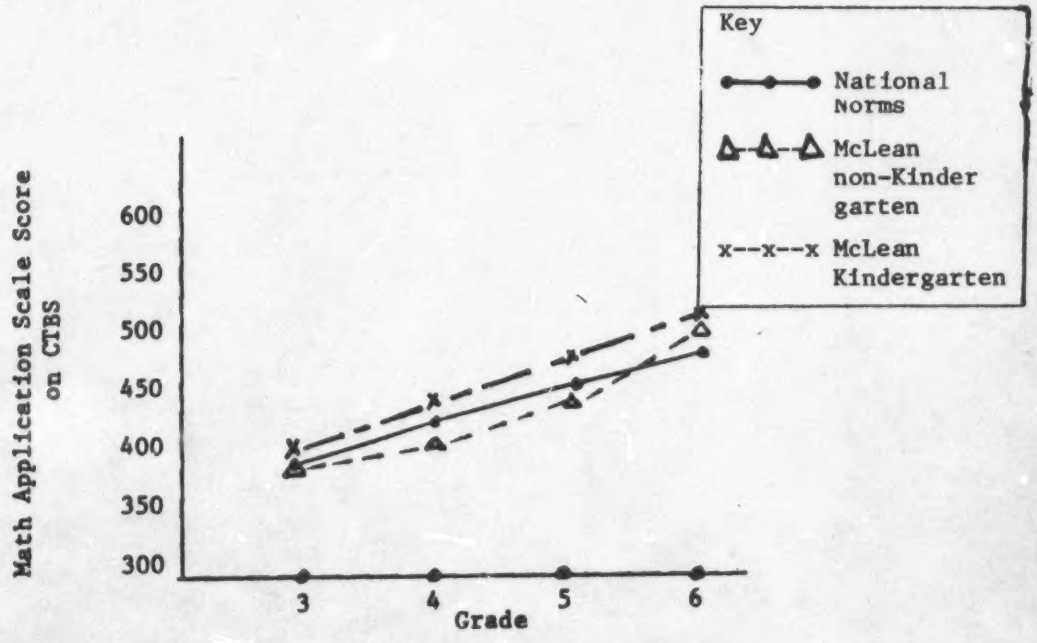

Figure 3

Comparison of McLean Students Attending Kindergarten and Not Attending Kindergarten with National Norms in Math Application

DISCUSSION OF THE FINDINGS

It was found that McLean students attending kindergarten scored higher than students not attending kindergarten in academic aptitude at all four grade levels tested (grades three through six). These differences were significant at grades three, four, and six. Data do not allow an interpretation as to whether attending kindergarten caused the increased scoring in academic aptitude or whether more academically capable children had been enrolled in kindergarten. However, differences in academic aptitude were found to exist and comparisons of achievement measures were statistically equated to control these differences.

In all achievement measures at every grade level tested kindergarten attendees outscored non-kindergarten attendees. However, differences between groups were large enough to produce statistical significance in only one of the 12 comparisons. This significant difference was found in language expression at the third grade level.

Comparisons were made between each of the two groups and national norms. These comparisons are graphically illustrated in figures 1 through 3. In both total reading and language expression non-kindergarten attendees outperformed the national sample at every grade level and kindergarten attendees outperformed non-kindergarten attendees at every grade level. In math application non-kindergarten attendees performed somewhat below national norms at grades three, four, and five and slightly above national norms at grade six and kindergarten attendees outperformed national norms and non-kindergarten attendees at every grade level.

The data would appear to indicate that McLean students who attend kindergarten tend to outperform students not attending kindergarten when differences in academic ability are controlled. Although the difference between groups reached significance in only one of the 12 comparisons it should be noted that all 12 comparisons showed kindergarten attendees outperforming non-kindergarten attendees.